SERVIS EX

Server Intelligent Switch

(For PC Server)

FS-1004EX

User's Manual

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FUJITSU COMPONENT LIMITED

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1. Introduction

Thank you for purchasing SERVIS EX (from here on, "the device" or "the switch device").
This computer-switching device (KVM switch) is PC/AT (from here on, "PC") compatible.
Using just one monitor, keyboard and mouse, this device allows you to operate several PC's.
PC's can be switched simply with the select switch or keyboard.
Safety instructions are provided to ensure the safe use of the switch device.
Also, be sure to thoroughly read this User's Manual before you start using the switch device to ensure correct use.
Be sure to keep this User's Manual in a safe place for future reference.

Note: Generally, this computer-switching device is also called the KVM switch (Keyboard Video Mouse switch).

2. Unpacking

Be sure to verify that the following items are included in the package when unpacking.
If any item is missing or damaged, immediately contact the place of purchase or our service department.

- SERVIS EX 1 unit
- User's Manual 1 manual

3. Safety Instructions

⚠ Read the "Safety Instructions" before use to ensure proper use of this product. Safety Instructions contained in this section are written for the user, in order to avoid any damage to property or injury to users; please read the following carefully.

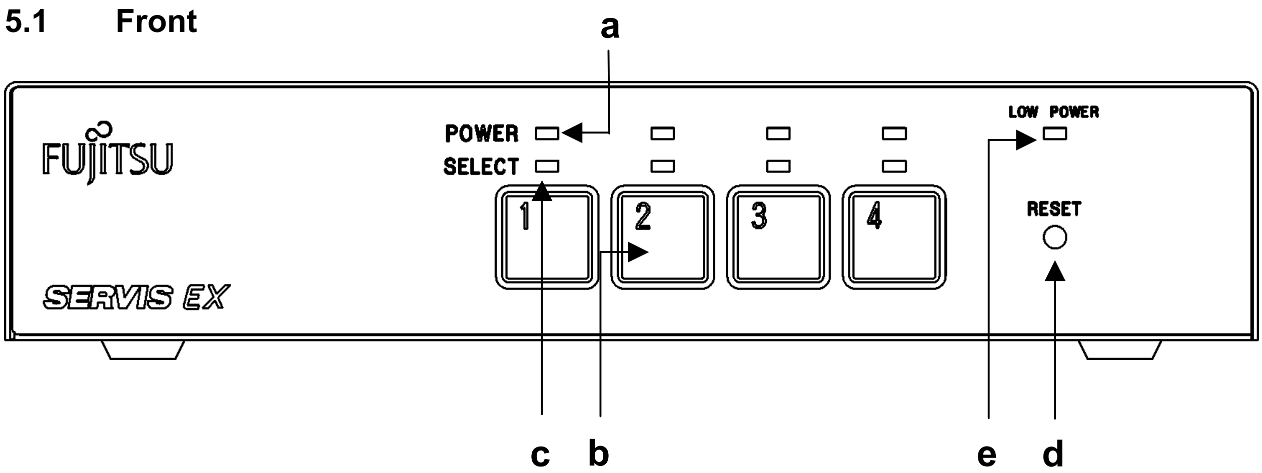
- Make sure that the power of the PC is OFF before connecting or disconnecting any of the connectors. Also, be sure to discharge any static electricity. Connecting or disconnecting the connectors while carrying a static charge or while the power of the PC is ON may damage the PC or this device. Please note that, damage of this kind is not covered by the warranty.
- Only PC's equipped with the following type of keyboard, mouse and monitor connectors can be hooked up to this device. Other specifications are not supported.
  - Keyboard connector: Mini DIN 6P female (PS/2) x 1
  - Mouse connector: Mini DIN 6P female (PS/2) x 1
  - Monitor connector: Mini D-SUB 15P female (VGA) x 1
- Connecting the PC requires optional dedicated cables (PS/2). There are two options: 3m and 5m. Use a 1.8m dedicated PS/2 cable for cascaded connections. Cables longer than that are not covered by the warranty.
- Special kinds of keyboards/mice (including programmable, wireless or those that require a specific driver), which are not supported, will not operate. Use appropriate equipment.
- The keyboard/mouse connector for this switch device is exclusively for PS/2 (Mini DIN 6P female). Serial mouse or USB type keyboard/mouse connection is not possible.
- Depending on the type of mouse (multi-functional mouse with wheel, etc.) or support software, the device may not operate normally.
- The keyboard/mouse connectors are the same shape. Check the colors and the orientation to connect them correctly. If they are forced in or connected incorrectly, the switch device may not function, and may be damaged as well.
- Set up the keyboard, mouse and monitor on each PC correctly. If they are not set correctly, they will not operate normally.
- A DVI (Digital Video Interface) compatible display cannot be connected.
- The display on the monitor connected to this device supports multi-scan, therefore check that it is also working correctly when connected directly to PC. The resolution that this device supports is 1600 x 1200 with a refresh rate up to 75 Hz. Also, the display may be off center after switching, due to monitor and resolution settings. Set the monitor or video card if necessary.
- Depending on the combination of monitor and video card, the screen display may show some degradation in quality (ghosts or blurring, etc.) or abnormality. This may be due to the monitor cable, the monitor or the video card, so try changing the monitor or the video card.
- The monitor cable connector is Mini D-SUB 15P. Make sure you connect it in the correct orientation, and use the fixing screw to fix it in place. If it is not connected properly, it may cause trouble.
- Cascading can only be performed with Fujitsu KVM switches only. You cannot cascade with switches produced by other manufacturers.
- The maximum number of levels of cascaded connections is two. More than two levels cannot be connected. Also, for a cascaded connection, make sure to connect a dedicated AC adapter to the master side.

4. Characteristics

- 4 PC's can be operated with only one keyboard/monitor/mouse. A lot of space can be saved.
- Switching is always stable, even at simultaneous PC boot-up.
- 5 or more PC's can be connected by using a cascaded connection. A maximum of 16 PC's can be connected.
  *In this case, additional device(s) and connection cable(s)/dedicated AC adapter(s) (sold separately) are necessary, depending on the number of PC's.
- A cascaded connection can be used with FS-1000 series, so your assets can be utilized effectively.
  *When this device is used as a master, some functions will be limited; for example, the OSD display is disabled.
- Switching can be done simply with the select button or keyboard. In addition, for keyboard switching, there are three kinds of Hot Keys to ensure flexibility.
  *The three Hot Keys are Ctrl+Alt+Shift, Ctrl x 2 and Scroll Lock x 2.
- All ports can be used for Plug-n-Play (PnP) monitors.
  The setting data (VESA DDC2/EDID) of the monitor can be saved in all ports; therefore, the PnP function of the monitor will become effective at simultaneous PC boot-up.
  *The PnP function needs to be supported by the monitor and the PC.
- PS/2 mice are supported.
  PS/2 keyboards such as Microsoft and Logicool are supported.
  The following PS/2 mice are supported: 2/3 button mice, all types of wheel mice (Microsoft IntelliMouse, Microsoft IntelliMouse Explorer, Logitech/Logicool MouseMan Wheel+, etc.) and Fujitsu FID677 (Multi-scroll mouse).
  *Special kinds of mice, which need dedicated drivers, are not supported.
- PS/2 keyboards are supported.
  *Special kinds of keyboards, which need dedicated drivers, are not supported.
- Auto Scan mode is installed for automatic switching, which is useful for PC monitoring. Also, the switching interval can be set (six levels from 3 to 60 seconds).
- For single use, an AC adapter is not necessary, because the device can be activated with the keyboard power of the PC.
  If the power capacity of the PC is not enough, a separate AC adapter can be used (available separately).
  *For a cascaded connection, one AC adapter is necessary at the master side.
- With an optional rack mount panel, 2 devices can be stored in 19-inch 1U space.
- This device can be connected to all PC/AT compatibles where PS/2 keyboard/mouse for PC/AT can be used.
  *Note that special kinds of OS's or keyboards/mice are not supported.

5. Component Names and Their Functions

5.1 Front



a. [POWER] LED

Lights up when the PC is ON.

b. [SELECT] Switch

Press this switch to select the PC.
You can select a PC even if its POWER LED is not lit.

c. [SELECT] LED

Lights up when the PC is selected.
It blinks when in the Hot Key mode or being reset.

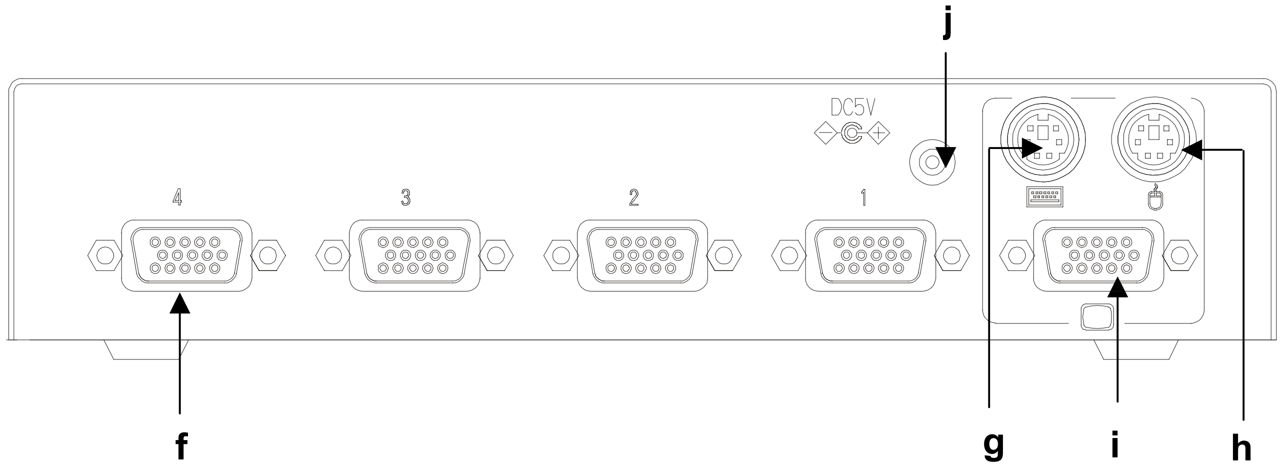
d. [RESET] Switch

Use this switch when PC selection is not possible, when the keyboard or mouse cannot be operated, or when the monitor setting data also needs to be saved. The [SELECT] LED's blink and PCs can be restored without being rebooted. Press it lightly with a metal pin or something.

e. [LOW POWER] LED

Lights up when the device cannot operate normally due to low power voltage inside the device.
When this light is on, make sure to connect a dedicated AC adapter.

5.2 Rear Panel



f. Connectors for PC Ports [1 through 4]

Connect each port (1 through 4) on this device to the PC's keyboard/mouse/monitor connector with the dedicated cable.

g. Keyboard Connector (Keyboard Icon)

Connect a PS/2 keyboard here.

h. Mouse Connector (Mouse Icon)

Connect the PS/2 mouse here.

i. Monitor Connector (Monitor Icon)

Connect the monitor here.

j. AC Adapter Connector

When the [LOW POWER] LED of the device lights up, connect the dedicated AC adapter here.

Also connect to the master side of a cascaded connection.

Do not use any AC adapters other than the dedicated ones. Doing so may cause damage to the device.

6. Setup

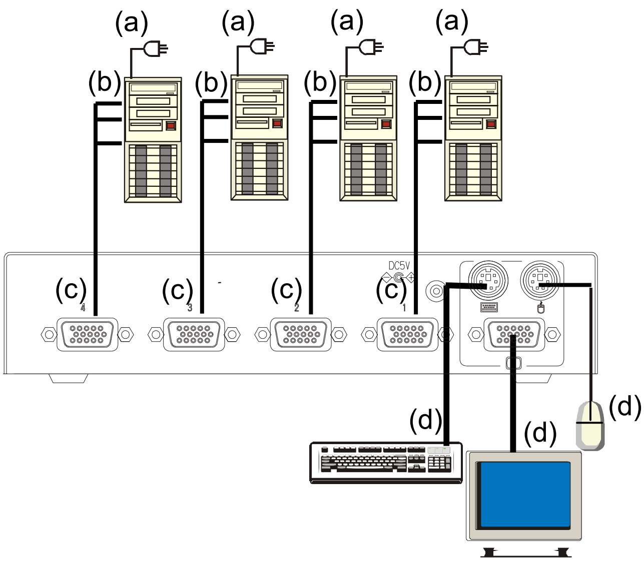
1)Getting Started

Make sure to confirm that the power cable for each PC is plugged into an electric outlet, and that the power is OFF. If the device is connected while the power of the PC is ON, the PC and/or this device may not function, and may be damaged as well. **(Confirm connection (a) and OFF)**

2)A. Using one switching device（When using one level)

It is possible to hook up a maximum of 4 PC's. See the diagram below.

(1) Connect the first PC's keyboard/mouse/monitor connector with each connector (color-coded) of the dedicated cable. **(Connect (b))**
(2) Next, connect the switching device[1]'s connector (MiniD-SUB15P(female)) for the PC port to the connector (black) of the dedicated cable. **(Connect (c))**
(3) After connecting, **make sure to fix each connector (MiniD-SUB15P) in place with a fixing screw.**
(4) Connect PC's 2 through 4 in the same manner.
(5) After the connections to PC's have been completed, connect the keyboard/mouse/monitor to the device. **(Connect (d))**
(6) After confirming that the connections have been done correctly, start the first PC only.
(7) After the PC's start-up, press the RESET switch once for the monitor setting data to be saved.
(For details, refer to "Monitor Settings" on page 9)
(8) After the setting has been done, re-start the first PC.
The monitor setting data is now effective.
(9) Then start other PC's in order. Once the monitor setting data has been saved, it is always effective, even when you start the PC's at the same time.
(10) Select each PC and check if the keyboard/mouse/monitor works properly. If not, refer to "Troubleshooting" on page 12 for necessary procedures.



PC Connection Diagram (1 Level)

3) B. Using multiple switching devices (Cascaded connections: When using two levels)

Cascaded connection means to connect more than one switching device. With cascaded connections, the first level is the master side, and the second level is the slave side. By using cascaded connections, it is possible to hook up a maximum of 16 PC's (1 master and 4 slaves). See the diagram below.

(1) Connect the PC's to the second level in the same way as for "when using one level". **(Connect (e))**

(2) Next, use the dedicated PS/2 cables to connect the PC ports of the first level to the keyboard/mouse/monitor connector of the second level. **(Connect (f))**

(3) After connecting, **make sure to fix each connector (MiniD-SUB15P) in place with a fixing screw.**

(4) To increase the number of slaves, connect them in the same way as described in steps 1 to 3 above. Do not connect slaves beyond the second level. Three-level connection cannot be done.

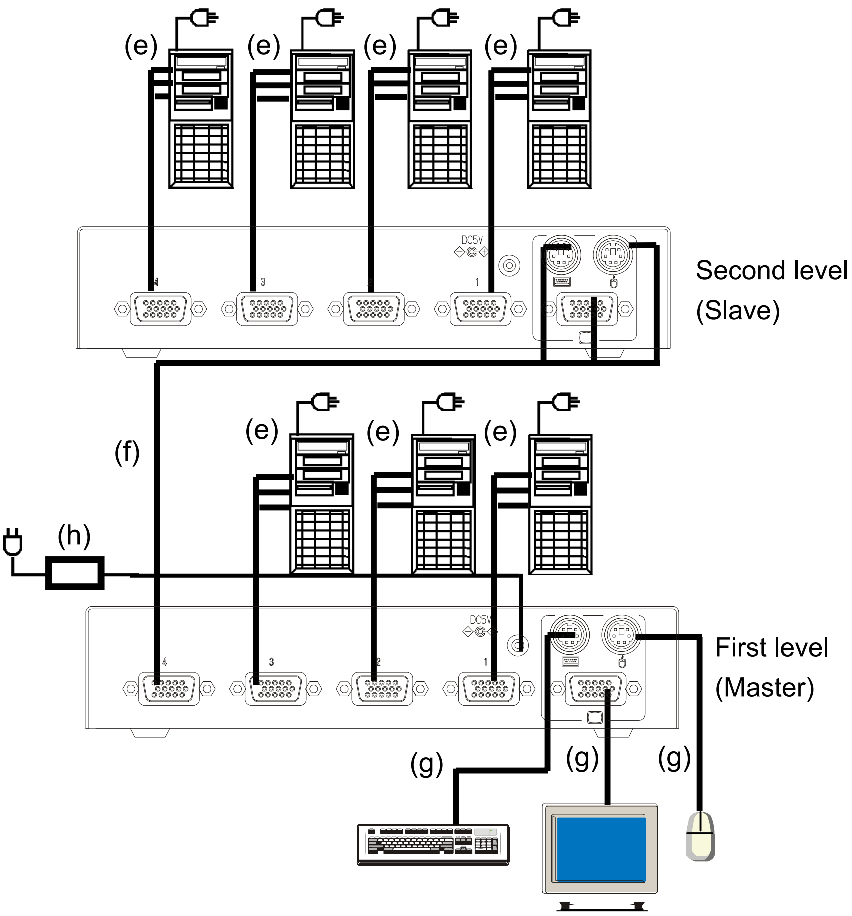
(5) After the connections to PC's have been completed, connect the keyboard/mouse/monitor to the master side. **(Connect (g))**

(6) After confirming that the connections have been done correctly, connect the dedicated AC adapter to the master side to supply power to the device. **(Connect (h))**

(7) If the SELECT LED device lights up, press the RESET switch once for the monitor setting data to be saved. The setting data will be saved at both the master and slave sides.
(For details, refer to " Monitor Setting" on page 9)

(8) After the setting has been done, start each PC. The monitor setting data is now effective. Once the monitor setting data has been saved, it is always effective even when you start the PC's at the same time.

(9) Select each PC and check if the keyboard/mouse/monitor works properly. If not, refer to "Troubleshooting" on page 12 for necessary procedures.



PC Connection Diagram (2 Levels)

7. Operation (Selecting PC)

There are two ways to select a PC: the select switch and the Hot Key Mode. Also, when the power to the selected PC is turned off, the status is preserved. Switch to the PC you want to select using the select switch or the Hot Key Mode.

1. PC Selection using the Select Switch

Press the select switch number of the PC you want to select and switch PC’s. Then, the SELECT LED above the selected number lights up. With cascaded connections, a PC can be selected directly by pressing the select switch number of the slave side and you don't have to switch to each PC in order from the master side. When using the select switch operation, the Hot Key Mode is released.

2. PC Selection by Keyboard (called Hot Key Mode)

Switch the PC’s by the following procedures. Switching cannot be done by pressing the "Select Key" directly. Also, note that the keyboard/mouse of the PC cannot be used in the Hot Key Mode.

"**Hot Key Mode**" -> Switch by "**Select Key**" -> "**End Key**" enables PC operation

(1) Hot Key Mode

At the time of purchase, the following three kinds of Hot Keys can be used. Also, enable/disable can be set.
Refer to "Enabling/Disabling Hot Key", and set the status as necessary.

- Press <Ctrl>, <Alt> and <Shift> keys together
- Press <Ctrl> key twice (Press it quickly (within 300ms) in succession)
- Press <Scroll Lock> key twice (Press it quickly (within 300ms) in succession)

In the Hot Key Mode, with or without cascaded connections, the SELECT LED on the master side changes from being lit to blinking (rapidly) and the Scroll Lock LED on the keyboard blinks as well. Although the lighted LED's (Num Lock, Caps Lock and Scroll Lock) on the keyboard will be turned off, the previous setting status will return once Hot Key Mode is terminated. The SELECT LED's on the slave side remain lit and do not blink.

(2) Select Key

A. Selection by the numeric keys

Select by the numeric keys (1 to 4). In this way, a PC with its power off can also be selected. With cascaded connections, select PC’s on the master side by number keys (1 to 4), and select those on the slave side by the function keys (F1 to F4). PC’s on the slave side can also be selected in the following ways.

Slave 1 selection: <F1> (immediate selection) or <F> and then <1> in order (within 1 sec/key)
Slave 4 selection: <F4> (immediate selection) or <F> and then <4> in order (within 1 sec/key)

B. Selection by the cursor keys

With the cursor keys <←><→>, selections can be done in order. In this way, a PC with its power off cannot be selected.

(3) End Key

A. <Enter> key: Ends the Hot Key Mode and the selected PC can be operated.
B. <Esc> key: Ends the Hot Key Mode, and the previous PC (before selection) can be operated.

3. **Auto Scan Mode**

Switch automatically after a certain period.

(1) During the Hot Key Mode, press the number <0> key for automatic switching. The SELECT LED changes from a quick blink to a slow blink.
(2) The switching interval can be adjusted by pressing the <↑> cursor key to make it shorter or the <↓> cursor key to make it longer.
(3) Allowed Auto Scan Intervals are: 3, 5, 10 (default), 20, 40 and 60 seconds.
(4) PC’s that are powered OFF will not be switched and will be skipped.
(5) No normal keyboard or mouse input is accepted while the Auto Scan Mode is running.
(6) To cancel the Hot Key Mode, press the End key.

4. **Enabling or Disabling the Hot Keys**

The Hot Keys can be enabled or disabled by setting. Set the status as necessary.
At the time of purchase, all Hot Keys are enabled. The setting is retained when the power is turned off.

(1) Disabling the Hot Keys

While pressing the select switch "2", press the Hot Key you want to disable. Do not release the select switch before pressing the Hot Key, or the setting will not be done. Once the setting is done, the Hot Key cannot be used. Change the status when necessary. Other Hot Keys can be disabled in the same way.

<Example> While pressing the select switch "2", press <Ctrl> + <Alt> + <Shift>.

(2) Enabling the Hot Keys

While pressing the select switch "1", press the Hot Key you want to enable. Do not release the select switch before pressing the Hot Key, or the setting will not be done. Once the setting is done, the Hot Key can be used. Change the status when necessary. Other Hot Keys can be enabled in the same way.

<Example> While pressing the select switch "1", press <Ctrl> + <Alt> + <Shift>.

(3) Initializing the Hot Keys

While pressing the select switches "1" and "3", press the reset button. The SELECT LED blinks and all Hot Keys are enabled.

5. **Monitor Setting**

Saves the monitor setting data (VESA DDC2/EDID) to all ports. At the PC's boot-up, the monitor's PnP function will be enabled.

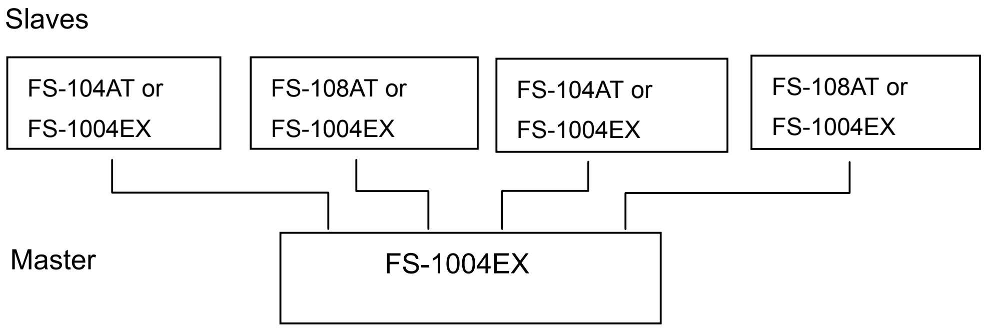
(1) Connect the monitor and set its power ON.
(2) While this device's power is ON (while the power of one or more PC’s is ON, or while the AC adapter is connected), press the reset switch.
(3) The SELECT LED blinks and the setting data (VESA DDC2/EDID) is saved to all ports. At the same time, all LED's (Num Lock, Caps Lock and Scroll Lock) on the keyboard blink. While blinking, no normal keyboard or mouse input is accepted.
(4) After completion, the SELECT LED stays on. And the LED's on the keyboard return to normal.
(5) Pressing the <E> key in Hot Key Mode performs the same process.
(6) With cascaded connections, pressing the RESET switch on the master side saves the data to the slave side at the same time. (No need to press the RESET button on the slave side)
(7) The setting data is retained even when all the PC’s are turned OFF, and will be enabled at PC boot-up. When the monitor is changed, reset following the above procedure and restart the PC

***The PnP function needs to be supported by the monitor and the PC. It does not work in a non-supported device.**

8. Notes for Cascaded Connections

When creating cascaded connections with a previous model device (FS-104 or FS-108), make sure to set this device as a master.
When creating cascaded connections with Fujitsu advanced model (FS-1004, FS-1008 or FS-1016), connect FS-1004EX at the slave side. (The OSD function will be effective.)
Use 1.8m dedicated PS/2 cables. Also, there are function limitations, as stated below.

<Example of cascaded connection>



1. Function Limitation (When the slave side is FS-104 or FS-108)

   A. Switching cannot be done directly by pressing the SELECT key of the slave side. First, with the SELECT key of the master side, switch to the port connected to the slave side.

   B. The monitor setting data cannot be saved in the slave side. To use the PnP function of the monitor, boot with the PC already selected. If not, disable the automatic PnP recognition (from the PC).

9. Specifications

Item		Specification
Product Name (Product ID)		SERVIS EX (FS-1004EX)
Supported Model		PC/AT
Number of Connected PC's (With Cascaded Connections)		Max. 4 (Max. 16)
Selection Method		SELECT Key, Keyboard (Hot Key Mode)
LED Display	POWER (Green)	4
	SELECT (Green)	4
	LOW POWER (Orange)	1
Interfaces	Keyboard	PS/2 Keyboard Interface (OADG compliant)
	Mouse	PS/2 Mouse Interface (OADG compliant)
Console Ports	Keyboard	PS/2, Mini DIN 6P Female x 1 (Purple)
	Mouse	PS/2, Mini DIN 6P Female x 1 (Green)
	Monitor	Mini D-SUB 15P Female x 1 (Blue)
PC Ports		Mini D-SUB 15P Female x 4 (Black)
Hot Keys		Three possible selections (Ctrl + Alt + Shift together, Ctrl x 2, Scroll Lock x 2)
Auto Scan Intervals		3 / 5 / 10 (default) / 20 / 40 / 60 seconds
Monitor Resolution, Refresh Rate		1600 x 1200 (Max.), 75Hz
Monitor Plug & Play Function		DDC2/EDID Compatible
Voltage / Current		DC5V / 0.2A (DC)
Current Supply to Keyboard/Mouse		Max. 150mA (1.5A: With AC Adapter)
Operating Environment		0~40ºC / 10~80%RH
Storage Environment		-20~60ºC
Construction		Painted (Black) Metal Case
Size, Weight		195 (W) x 104 (D) x 40 (H) mm, 0.7kg

10. Optional Accessories

Item	Product ID	Remark
Dedicated PS/2 Cable 1.8m	NC14000-B602	Also for cascade connections
Dedicated PS/2 Cable 3m	NC14000-B603	
Dedicated PS/2 Cable 5m	NC14000-B605	
Dedicated Rack Mount Panel	NC14003-T032	
Dedicated AC Adapter	NC14003-T055	

11 Troubleshooting

Symptom	Cause	Action
The LOW POWER LED is on	Cascaded connections are done	Connect the dedicated AC adapter to the master
	Lack of power supply	Connect the dedicated AC adapter
The keyboard and mouse do not operate or operate strangely	The keyboard and mouse connections on the PC are reversed	Match the port No.s
	Hot Key Mode is not released	Press the [Enter] or [ESC] key
	Not connected properly	Connect properly
	Connection/cable is defective	Confirm the connector connection Replace with a new cable.
	A non-supported keyboard or mouse is connected	Replace with a supported keyboard or mouse
The scroll function or button does not operate	Mouse not supported	Replace with a supported mouse
	The specific mouse driver is not installed	Install the specific mouse driver
The PnP of the monitor does not function	Monitor or PC does not support PnP	Change to a supported environment
	The setting data is not saved	Refer to "Monitor Settings", and set correctly
	Monitor side is connected with BNC connector	Change to VGA connector
Poor screen display (Faded images, blurred characters, etc.)	Connection/cable is defective	Confirm the connection Replace with a new cable
Window shifts or does not display when switching	Wrong resolution	Adjust the resolution or the monitor settings
	Unsupported monitor, or cannot synchronize	Replace with a supported monitor (multisync) Adjust the monitor
Cannot go into Hot Key Mode	Hot Key is disabled	Initialize the Hot Keys
	Wrong key or pressed wrongly	Refer to "Hot Key Mode", and press correctly
Auto Scan Mode cannot be set	Hot Key Mode is not on	Refer to "Hot Key Mode", and press correctly
	Wrong key	Press the number key (0)
Switching cannot be done by Keyboard	Hot Key Mode is not on	Refer to "Hot Key Mode", and press correctly
	Wrong key	Refer to "SELECT Key", and press correctly
The auto scan switch cycle is abnormal	The switch cycle has not been set correctly (The default value is 10 seconds)	Refer to "Auto Scan Mode", and set correctly
Operation stops after a period of normal operation	Connection has been disrupted	Check the connections and restart
	The switch is hung up	Press the reset switch
	A problem has occurred at the PC	Correct the problem at the PC
The LED on the device does not light even after turning on the host	The PC's keyboard port's power circuit protection element has failed	Correct the problem at the PC
Cascaded connections are not recognized	Non-Fujitsu switching device is connected	Cascade with Fujitsu KVM switch
	A problem has occurred at the switch	Press the reset switch

Note

NC14004-L530_01

This manual is made of recycled paper.